

1) $(a^3b^{-2}c^{-3})(a^{-4}bc^3)$

$$a^{3-4}b^{-2+1}c^{-3+3} = a^{-1}b^{-1}c^0 = \frac{1}{ab}$$

2) $\left[\frac{(x^{-5}y^3)^0}{(x^4y^2c^{-1})^0} \right]^{-2}$

$$\left[\frac{1}{1} \right]^{-2} = 1^{-2} = 1$$

Evaluate each expression showing all work.

1. $\frac{(14-4)^2}{(4-2)} + 3^4 \div 3$

$$\frac{10^2}{2} + 81 \div 3 = \frac{100}{2} + 27 = 50 + 27 = 77$$

2. $-2 + [18 \div (9-2 \cdot 3)]$

$$-2 + [18 \div (-6)] = -2 + [-3] = -2 - 3 = -5$$

3. $\frac{1}{2}(80 \div 8) + 2^2 - 4 \cdot 2$

$$\frac{1}{2}(10) + 4 - 8 = 5 + 4 - 8 = 1$$

4. $8 - 6 \div 3$

$$8 - 2 = 6$$

5. $(x^3y^{-2}z)^{-2}$

$$x^{-6}y^4z^{-2} = \frac{y^4}{x^6z^2}$$

6. $(a^{10}b^4c^{-17})^1$

$$a^{10}b^4c^{-17} = \frac{a^{10}b^4}{c^{17}}$$

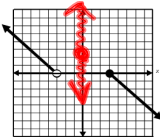
7. $\left(\frac{3}{2}\right)^{-2}$

$$\left(\frac{2}{3}\right)^2 = \frac{4}{9}$$

8. $\left(\frac{1}{216}\right)^{-\frac{2}{3}}$

$$(216)^{\frac{2}{3}} = (216^{\frac{1}{3}})^2 = 6^2 = 36$$

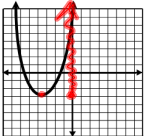
State if the following relation is a function. Then find the domain and range.



9. FUNCTION? Y or N

10. Domain: $[-2, 2]$

11. Range: $[1, 3]$



12. FUNCTION? Y or N

13. Domain: $(-\infty, \infty)$

14. Range: $[-1, \infty)$

Determine the following using the given functions.

$f(x) = x^2 - 1$ and $g(x) = 2x - 3$

15. $f + g$

$$(x^2 - 1) + (2x - 3) = x^2 + 2x - 4$$

16. $f \cdot g$

$$(x^2 - 1)(2x - 3) = 2x^3 - 3x^2 - 2x + 3$$

17. $f(g(x))$

$$(2x - 3)^2 - 1 = 4x^2 - 12x + 8$$

18. $g(f(x))$

$$2(x^2 - 1) - 3 = 2x^2 - 5$$

19. Find $g^{-1}(x)$

$$y = 2x - 3 \Rightarrow x = \frac{y+3}{2} \Rightarrow g^{-1}(x) = \frac{x+3}{2}$$

20. Find $f^{-1}(x)$

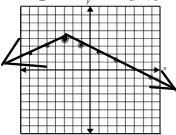
$$y = x^2 - 1 \Rightarrow x = \pm\sqrt{y+1}$$

Does not exist

Graph the following. Be sure to label the vertex.

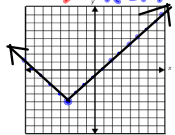
21. $f(x) = \frac{1}{2}x + 3 + 4$

$h = -3, k = 4$



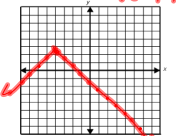
22. $f(x) = x + 3 - 4$

$h = -3, k = -4$



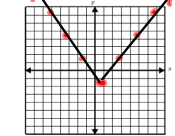
23. $f(x) = \frac{1}{2}x + 4 + 2$

$h = -4, k = 2$



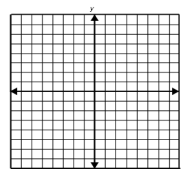
24. $f(x) = \frac{3}{2}x - 1 - 2$

$h = -\frac{2}{3}, k = -2$

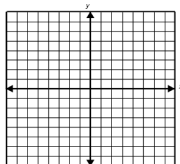


Graph the following piecewise function.

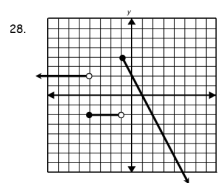
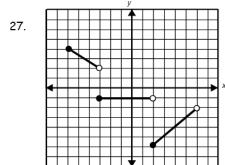
25. $f(x) = \begin{cases} -\frac{1}{2}x + 2 & \text{if } x \leq -2 \\ x + 1 & \text{if } -2 < x \leq 3 \\ 6 & \text{if } x > 3 \end{cases}$



26. $f(x) = \begin{cases} x-4 & \text{if } x \leq 6 \\ -\frac{1}{2}x+3 & \text{if } x > 6 \end{cases}$



Write the equations of the functions graphed below.



Identify each transformation from the parent function to the given $f(x)$.

Transformation

29. $f(x) = \frac{1}{2}|x-3|+2$ *Vertically Compressed by a factor of $\frac{1}{2}$, Shifted 3 units right and 2 units up*

30. $f(x) = -2|x|+2$ *Reflected over x-axis, Vertically stretched by a factor of 2, Shifted up 2 units*

31. $f(x) = |x-4|-6$ *Shifted right 4 units, down 6 units*

Write the function for each graph described below.

32. the graph of $f(x) = |x|$ translated 10 units to the left and 3 units up and reflected over the x-axis.

$f(x) = -|x+10|+3$

33. the graph of $f(x) = |x|$ vertically stretched by a factor of 2, and translated 8 units to the right.

$f(x) = 2|x-8|$

34. the graph of $f(x) = |x|$ vertically compressed by a factor of $\frac{1}{4}$, reflected over the x-axis and translated 4 units down.

$f(x) = -\frac{1}{4}|x|-4$

$|\frac{2x-1}{2}| \geq \frac{5}{2}$

$|x-\frac{1}{2}| \geq \frac{5}{2}$

*$x-\frac{1}{2} = 6$
 $x = \frac{13}{2}$*

